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ABSTRACT

The Serrano decision has caused policy makers in California to search for departures from the current system of public school finance. Citizen and legislative evaluation of alternative finance systems is being confused by the employment of diverse interpretations of Serrano. Although the Court's decision may appear to indicate clear-cut methods of repair, a careful analysis of criteria implied by reform proposals and the logic of Serrano reveal substantial divergences. The Serrano criteria prohibit most proposals currently being promoted--expanded supplemental aid schemes and system neutrality alternatives are clearly misguided reform attempts; full state funding, coordinated tax base sharing, and proportional power equalizing seem to be acceptable, with coordinated tax base sharing being the best alternative. There is, however, an internal conflict in the Serrano logic. Insofar as local district control is maintained over choice of property tax rates, and property assessed evaluation is retained as a major source of revenue, the portion of Serrano calling for a family's cost of education to be independent of the wealth located in the district in which the family resides cannot be met. (Author/IRT)

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THE MEANING OF SERRANO CRITERIA FOR CALIFORNIA PUBLIC SCHOOL FINANCE

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The Serrano Supreme Court decision and subsequent completion of trial in Los Angeles have caused policy makers in California to search for drastic departures from the current system of public school finance. Several types of alternative finance systems are being promoted in the political competition for support of replacements. Citizen and legislative evaluation of these proposed alternatives is being confused by the employment of diverse interpretations of Serrano. Though the court's decision invalidating the current method of finance may appear to indicate clear-cut methods of repair, a careful analysis of criteria implied by reform proposals and the logic of Serrano reveal substantial divergences. This paper argues that Serrano criteria prohibit most proposals currently being promoted to make California's school finance system constitutionally valid. And further, an evaluation of several types of finance systems suggests that a relatively unconsidered method of reform, coordinated tax base sharing, would best conform to political and court criteria for public school finance.

Criteria inferred by Serrano

California's Supreme Court ruled that the current method of public school finance "invidiously discriminates against the poor" and is therefore unconstitutional because, in the case of public schools, the form of discrimination now used to make educational opportunities available to use "violates equal protection rights."[1/] The chain of reasons which led to this conclusion is as follows. Access to education opportunities in public schools, a "fundamental interest" of all children and parents, cannot be "conditioned" on the state's wealth classifications unless the state can supply a "compelling" reason for doing so.

1/ See West's, 1971.

Local property tax base is a state system of wealth classification. The court ruled that local property taxation could be used to finance school expenditures, but only in a manner such that the amount of property tax base in a district, or possessed by a particular family, does not make family access to public education opportunities unequal to that which could be obtained in other districts or by other families in one's own district. This does not mean that equal expenditures per pupil are required in all districts. It means that neither the amount of tax base per pupil in a district, nor that held by any family or group of families can "condition" a pupil's access to public schooling. Thus Serrano is not a complaint against local property as a school tax base, but by inference, is a criticism of the rationing function that local property taxes perform in the current finance system.

The phrases "conditioned by wealth" and "function of wealth" are used in the Serrano decision to distinguish legislative classifications that (1) cause discrimination based on those classes to be effective in allocating a public service, from (2) those cases where legislative classifications are useful for some purposes other than rationing access to a service (e.g. provide revenues). For example, the state might finance park services with taxes that classified taxpayers by individual wealth or wealth of the district in which a taxpayer resides. Assuming access to parks was a "fundamental interest" of all families, such finance arrangements would not "invidiously discriminate" so long as tax liabilities so based did not act as a constraint making the marginal (financial) cost of more park service greater for one district than another, or making a family's individual marginal (financial) cost of more park service greater in one location than in another. Therefore, families could be assessed a park tax that varied with family wealth and area of residence.

And this would not violate equal protection rights so long as park provision (location quantity and quality) criteria excluded the tax classifications, and so long as park fees, or other rationing criteria imposed on individual park users, excluded the tax classifications. If the state were to use tax base criteria in fixing legal constraints on park expenditures benefiting specific groups of citizens, then citizen access to park services would be a "function" of the state's wealth classifications. If park admission fees were varied according to district or to a family's park-tax base, citizen access to service would be "conditioned" by the state's wealth classifications.

The Serrano decision criticized local property tax reliance in the state finance system because the amount of tax base in a school district was allowed to determine the "amount of revenue available" in any district for per pupil expenditures.[2/] The state's wealth classification is a key variable for determining the (tax) price of public schooling per pupil in each district's spending constraint. In addition to assigning economic burdens to individual families, local property taxes also make "... the quality of a child's education a function of the wealth of his parents and neighbors." That is, the state's wealth classifications are allowed to perform a rationing function. Two consequences of this use of wealth classifications seemed to bother the court.

First, the child class in the Serrano suit had financing for public school expenditures limited by the district property tax base in which their parents happened to reside. Since districts were organized such that tax base per pupil varied considerably from district to district, this led to "substantial disparities" in expenditures per pupil and the state's wealth classification thus became

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2/ "amount of tax base available" would have been superior terminology since "revenue available" is the consequence of both wealth constraints and willingness to sacrifice ---- the influence of preferences on choice.

effective in rationing access to "educational opportunity." Great interest and motivation on the part of citizens in "poor" districts --- to overcome their relative wealth disadvantage, by imposing school property tax rates higher than those imposed by "rich" districts --- did not eliminate expenditure disparities. Neither was state equalization or supplemental aid found by the court to be a legal cure for the consequences of local property base constraints on local school district supply decisions.

Second, the parent class in the Serrano suit enrolled their children in the district of family residence and paid (school) property taxes there. Family calculation of cost that would result from marginal changes in district school expenditures per pupil was dominated by concern for local tax rate changes that would be required for altered expenditure levels. There were of course other variables in family marginal cost calculations, but the court reasoned that matching aid provisions and other forms of discrimination (among districts and types of students) did not constitute a cure for the effects of making individual parent costs of providing access to public educational opportunities a function of district wealth. More plainly, equally wealthy families in the state would face very different costs of expanding public school expenditures per pupil depending upon the district in which they were to reside.[3/] Defendants in the Serrano suit argued that the state school finance plan did not directly admit parent wealth classifications into school rationing criteria, and that "indirect" discrimination among parents on the basis of district wealth, was permissible. The Supreme Court rejected this claim. The decision states, "We think that discrimination on the basis of district wealth is

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3/ Ibid., West's, 1971, pp. 625. In the court's (borrowed) words, "... that as a direct result of the financing system they (parents in poor districts) are required to pay taxes at a higher rate than taxpayers in many other districts in order to secure for their children the same or lesser educational opportunities

equally invalid. (and that) ... the school finance system discriminates on the basis of the wealth of the district and its residents." 4/

It seems obvious to economists that an individual's wealth and the wealth of other taxpayers in a district will constrain individual choices and modify revealed preferences. No law can prevent wealth status from "conditioning" choices, including those for public school provision. The court decision does not deny or ignore this economic reality, though some of the language used in Serrano might be so interpreted. More reasonably, the judges disagree with the notion that local control over public school expenditure decisions requires that locally spent revenues be largely derived from taxes on local wealth. So long as local assessed valuation is the primary source of district revenue, equally situated families face significantly different private marginal costs for public schooling depending upon the family's residency. The court's complaint with inclusion of such wealth classifications in education legal criteria is that inclusion "actually deprives" those in "poor" districts of choice based on marginal (financial) costs equal to marginal (financial) costs faced by those in "wealthy" districts. The court concluded that any defense of current arrangements leaving local wealth classifications binding on local public school expenditure budgets on grounds that such discrimination is necessary for decentralized school decisions, is a "cruel illusion for the poor school districts." 5/

School District Financial Constraints

The constitutional criteria implied by Serrano can be more rigorously stated by introducing the notion of a district financial constraint (DFC). In a decentral-

4/ Op.Cit., West's, 1971, pp. 615.

5/ Op.Cit., West's, 1971, pp. 620.

ized public school system, state government sets financial rules that define the permissible sources and amounts of revenue that local school districts may spend. This very complex and extensive set of finance rules faced by a school district is its DFC. In California, the essence of a DFC for an i^{th} school district can be summarized as follows:

(1) $E_i = r_i W_i + [(W^* - a_i W_i) + R^*] + c_i [W^{**} - W_i] + m_i E_i$

E_i = expenditures per a.d.a. in i^{th} district

r_i = school property tax rate in i^{th} district, $o<r_i<1$

W_i = assessed valuation per a.d.a. in i^{th} district

W^* = foundation aid level per a.d.a., less flat grant aid per a.d.a.

a_i = equalization aid rate for i^{th} district, $o<a_i<r_i$, amount per a.d.a. being $(W^* - a_i W_i)$ for $(W^* - a_i W_i) > o$ but zero for $(W^* - a_i W_i) < o$

R^* = flat grant per a.d.a.

c_i = supplemental aid rate for i^{th} district which is positive $(o<c_i<r_i)$ for $(W^{**} - W_i) > o$ but $c_i = o$ for $(W^{**} - W_i) < o$.

W^{**} = supplemental aid level determined by local tax rate limit constraints.

m_i = expenditures aid rate for matching grants to i^{th} district

The DFC implies a balanced budget must be maintained. All revenues are derived from either local taxes $(r_i W_i)$ or state aid (R_{si}).[6/] State revenues spent

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6/ Federal grants-in-aid and revenue sharing revenue sources are ignored in this discussion.

in local districts are received in four forms: flat grants per a.d.a. (R^*); equalization aid ($W^*-a_iW_i$); supplemental and tax (rate) limit aid ($c_i(W^{**}-W_i)$; and matching grant funds (m_iE_i). Notice that local tax revenues and three sources of state aid are functions of W_i (district wealth in Serrano terms). The amount of i^{th} district revenue per a.d.a. that is derived from state transfers in each fiscal period is defined as:

$$(2)\quad R_{si} = \left[R^* + (W^*-a_iW_i) + c_i\,(W^{**}-W_i) + m_iE_i\right] \geq R^*$$

It can be seen that state transfers are inversely related to district assessed valuation per a.d.a. This feature of DFC's does not constitute a cure for the Serrano invalidation of the system. In the post-Serrano period, state government greatly expanded state aid to school districts, primarily poor districts, through greater supplemental aid and compensation for property tax rate limits. Obviously the court ruled that the "revised" financial plan would serve as an interim law but that such wealth discrimination in favor of lower wealth districts amounted to an ineffective patch on a basic structure that would have to be redone.

By rearrangement the DFC and state aid formulas become: 7/

$$(1.1)\quad E_i = \frac{r_i-(a_i+c_i)}{1-m_i}\cdot W_i + \frac{W^*+R^*+c_iW^{**}}{1-m_i}$$

$$(2.1)\quad R_{si} = \left[[R^*+W^*+c_iW^{**}+m_iE_i] - (a_i+c_i)\cdot W_i\right] \geq R^*$$

Clearly both of these formulas and their conditions on parameter size must hold in each fiscal period for each district, thus making $E_i \geq R^*$ and both local and state revenue sources above R^* functions of W_i. From (1.1) the following DFC

7/ $(a_i + c_i) < r_i$ must, and does, hold.

relations are imposed by the state:

$$\Delta E_{i/\Delta W_i} = \frac{r_i-(a_i+c_i)}{1-m_i} > o$$

$$\Delta E_{i/\Delta r_i} = \frac{! W_i}{1-m_i} > o$$

Assuming that a_i, c_i and m_i are constants and equal for all districts, except when one or both of a_i and c_i are zero for high wealth districts, it can be seen that the impact on E_i of a unit increase in W_i for a given r_i, is greater for districts above the equalization and supplemental aid cut-offs. This is because, when a district is below cut-off levels, growth in W_i will decrease state aid, all else the same. No such marginal sacrifice is experienced above the cut-off levels.

The $\Delta E_{i/\Delta r_i}$ relation shows that the impact on E_i of a unit change in r_i is proportional to a district's local assessed valuation per a.d.a. --- $\Delta E_{i/\Delta r_i}$ is larger the greater is W_i: A diagram of representative DFC's will illustrate the problem seen by courts in allowing pupil access to E_i to be conditioned on access to W_i. Assume that a poor district has local tax base per a.d.a. equal to W_1 and a wealthy district has W_2. The intercept K represents the amount of E_i that a district could conceptually support even if W_i was zero. From the DFC in equation (1.1), K is equal to $\frac{W^*+R^*+c_iW^{**}}{1-m_i}$. It can be seen, then, that for a_i, c_i and m_i the same, district one must levy a higher property tax rate than district two in order to achieve any given level of E_i, $\bar{E}$ is used for illustration.[8/] If c_2 = o and

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8/ For district two where $a_i = c_i = o$, the relations become:

$$\Delta E_{2/\Delta W_2} = \frac{r_2}{1-m_2} > o$$

$$\Delta E_{2/\Delta r_2} = \frac{W_2}{1-m_2} > o$$

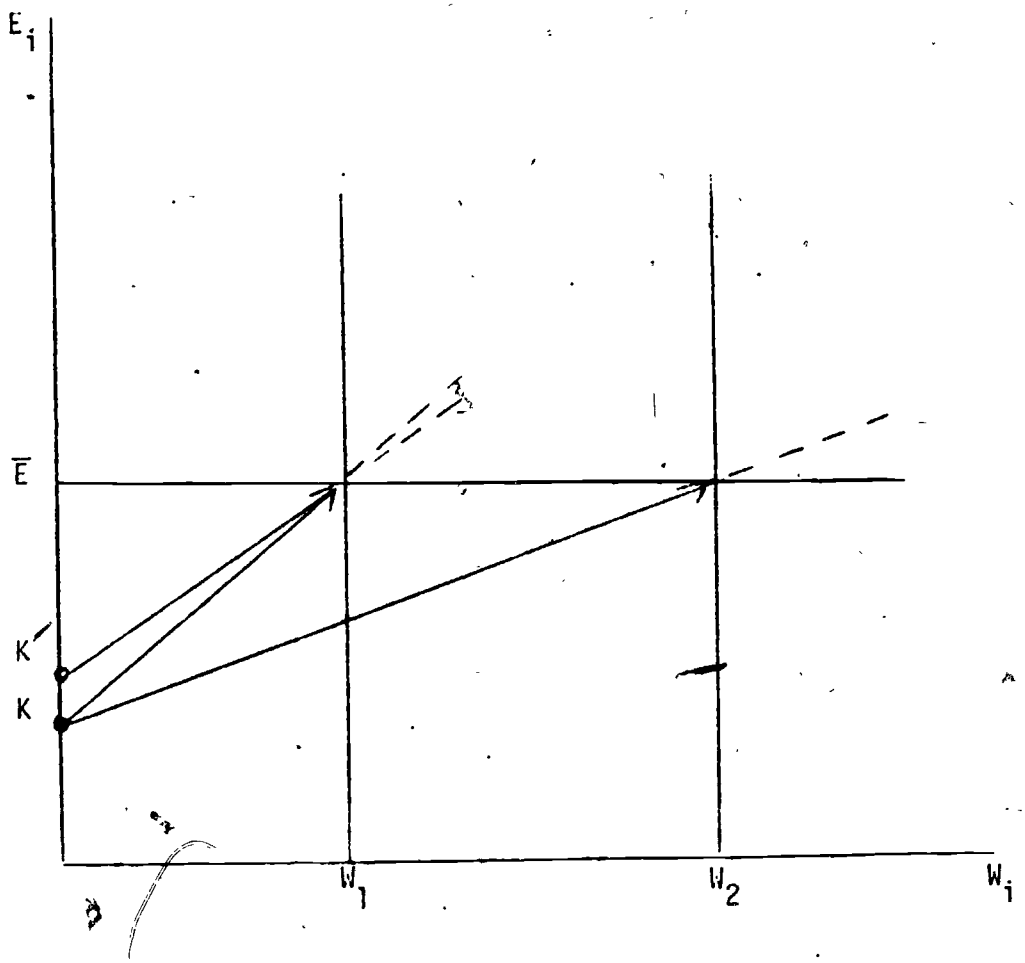

Figure I

$c_1 > o$, then $K_1 > K_2$ is implied. Some of the difference in required rates for equal E_i is then removed. But supplemental aid, as its name implies is a relatively minor source of state aid. Realisticly, differences produced by supplemental aid in the basis from which local revenue may build will not negate or reverse the illustrated disparity featured in the Serrano decision.[9/] The effect of $c_1 > o$, $c_2 = o$ is illustrated by setting $K_1 = K'$ an arbitrarily small distance above K (a $c_1 = c_2 > o$ position).

The first Serrano criterion, described from the point of view of the child class, can now be stated. It says in essence that the influence of state wealth classifications on "district prices" of education must be zero:

I. The DFC_i confronting i^{th} district citizens must have the property that $\Delta E_{i/\Delta W_i} = o$, for r_i and state defined parameters for computing R_{si} given.

This says that growth in W_i, all else the same, cannot increase (or decrease) the amount of E_i made available in the district. For $\Delta E_{i/\Delta W_i} \neq o$, district prices will be wealth discriminatory and a child's access to educational opportunity via public schooling expenditures, which depends upon the tax rate district citizens must take upon themselves to achieve any given level of E_i, will vary depending upon the district where the pupil happens to reside.[10/]

A second Serrano criterion, described from the point of view of the parent class, can also be stated in terms of DFC. It requires that "family prices" also be invariant to changes in district of residency. The financial cost of public school-

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9/ There is a further complication. Disparities caused by wealth differences and modified by "reverse" wealth discrimination merely shift disparities (e.g. to "middle wealth" districts or some other portion of the state's wealth classification).

10/ Equal "educational opportunity" may require that some classes of students have access to greater public expenditures than other students. This is possible within the Serrano criteria but is neither required nor found to be desirable by the Serrano decision.

ing from the point of view of an individual family is a function of the family's tax base status and the amount by which tax rates must increase to the family if district expenditure per a.d.a. is increased by one unit.

In any fiscal period the amount of state revenue that must be transferred to districts is $\sum_{i=1}^{d} (ada)_i R_{si}$, for d districts. The state must raise this total sum with a state (school) tax. For this discussion of the existing school finance system and all proposed alternative finance systems, assume the state levies a proportional tax on family income (y_k) of all families in the state. The state tax rate (t) levied on citizens in any i^{th} district is not a function of R_{si} or $r_i W_i$. For ease of discussion $t = \left[\sum_{i=1}^{d} (ada)_i R_{si}\right] \Big/ \sum_{k=1}^{f} y_k$ for y_k equal to the k^{th} family income base, f families in the state.

A k^{th} family's perceived marginal (financial) cost, FMC_{ik}, of a unit increase in the family's own i^{th} district E_i is given by:

$$(3) \qquad FMC_{ik} = \Delta r_i \, w_{ik} + \Delta t y_k$$

where w_{ik} is the family's i^{th} district property tax base. Under our assumptions for t, family price with respect to ΔR_{si} (induced by ΔE_i) is determined by Δt which is not a function of W_i. However, family price, for a unit increase in E_i, with respect to the portion financed within the district is determined by Δr_i. It was argued above that, for the existing system of school finance, $\Delta E_{i/\Delta r_i}$ was a (proportional) function of W_i; the greater is district wealth, the smaller will be the required increase in r_i to a family for district "purchase" of a unit increase in E_i. Or, to state the proposition yet another way, equal status[11/] families in the

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11/ That is, same family income and individual property tax bases.

stat realize unequal marginal financial burdens from increased expenditures per a.d.a. if th es reside in districts with unequal assessed valuation per a.d.a.

The second Serrano criterion for education finance can be stated as:

II. The DFC_i constraining the public school choices of any k^{th} family must have the property that $\Delta\left(\Delta E_{i/\Delta r_i}\right)/\Delta W_i = o$.

This says in essence that "family prices" for public school expenditures must not vary between possible district locations, e.g. between the i^{th} and j^{th} districts:

$FMC_{ik} = FMC_{jk}$. [12/]

Thus, by criterion I "district prices" must not depend upon district wealth; by criterion II "family prices" must be independent of the wealth located in the district where the family has its residency. A conceptual problem arises, however. In the equation (3) specification of FMC, each district W_i can be viewed as a combination of two types of property. First, taxable property with burdens that will be borne totally by assessed individuals within the district. And second, taxable property with burdens that are largely "exported" from the district or that have unknown incidence. It can be assumed that residential property falls in the first category. Large proportions of a district's commercial-industrial-agricultural property make up the second category of W_i. For convenience of discussion, assume that the portion of W_i identified for the first category is $\sum_{k=1}^{n} w_{ik}$, for n families in the i^{th} district. Property of the second type is represented by the base W_i^c. Then:

$$(4) \qquad W_i = \sum w_{ik}/(a.d.a.)_i + W_i^c/(a.d.a.)_i$$

12/ Note also that $\Delta E_{i/\Delta r_i}$ is proportional to m_i and if $m_i \neq m_j$ then $FMC_{ik} \neq FMC_{jk}$. However this form of price discrimination is permissible so long as differences in m are not based on a "wealth" classification.

which implies that FMC_{ik} is:

$$(3.1) \qquad FMC_{ik} = \Delta r_i(w_{ik} + s_k W_i^c) + \Delta ty_k$$

where s_k is the perceived family "share" in tax burdens associated with increased local taxation of W_i^c type property in the district. Not much is known about s_k perceptions. However, it is clear that a family's minimum share of burdens is zero, $s_k \geq o$. Further, the definition of W_i^c implies that $\sum_{k=1}^{n} s_k < 1$. Thus, FMC_{ik} will be greater for $W_i = \Sigma w_{ik}$ ($W_i^c = o$ which is the relation assumed in equation (3)) than for equal W_i, $W_i^c > o$, since each dollar increase in W_i^c would reduce Σw_{ik} by one dollar and perceived tax burdens by more than one dollar.

The belief, that families in districts with higher $W_i^c / \Sigma w_{ik}$ ratios face lower FMC than equal status families in equal W_i districts with lower $W_i^c / \Sigma W_{ik}$ ratios, was stated by Justice Powell who wrote the U. S. Supreme Court majority decision in Rodriguez:

> Appellees further urged that the Texas system is unconstitutionally arbitrary because it allows the availability of local taxable resources to turn on "happenstance." They see no justification for a system that allows, as they contend, the quality of education to fluctuate on the basis of the fortuitous positioning of the boundary lines of political subdivisions and the location of valuable commercial and industrial property... (but it is) inevitable that some localities are going to be blessed with more taxable assets than another...For instance, commercial and industrial enterprises may be encouraged to locate within a district by various actions---public and private...(but) it has simply never been within the constitutional prerogatives of this court to nullify statewide measures for financing public services merely because the burdens of benefits thereof fall unevenly depending upon the relative wealth of a political subdivision in which citizens live."

Clearly, both appellees and the U. S. Supreme Court majority assumed that greater W_i^c was a local district advantage in terms of citizen tax burdens for school support.

It should be made clear, however, that if $s_k = o$, then there is no Serrano criterion problem so long as $\Delta\left(\Delta E_i/\Delta r_i\right)\Delta W_i^c = o$. For $s_k > o$, the sign of $\Delta FMC/\Delta W_i^c$ is negative because Δr_i represents the change in local rate required for a unit increase in E_i and $\Delta r_i/\Delta E_i$ is a function of W_i^c. It is also clear that $\Delta\left(\Delta r_i/\Delta E_i\right)/\Delta W_i^c$ is negative --- a lower rate is required for a unit increase in E_i all else the same. It is not clear whether in all cases a family move to an equally wealthy district with a higher W_i^c/M_i ratio will lower FMC since the stability of S_K with respect to family location is unknown.

Since for individual families little can be said about the size of s_k, it will be safe to employ an arbitrary assumption. Statewide, the sum of burden shares must reach one (or nearly so; only burdens "exported" from the state will cause the sum to be less). And each district's "exports" are another district's imports. This will lead individuals to see that all burdens placed on W_i^c property will be realized in lower income receipts or lower purchasing power of money income. For convenience of discussion, assume that $\Delta r_i s_k W_i^c = \Delta p_k y_k$; district property taxes on W_i^c are viewed as a proportional decrease in personal income. We therefore ignore the conceptual difficulties of reconciling criterion II with district allocations of W_i^c type property base in the remainder of this discussion. Obviously, a grave practical problem remains in reconciling any local-control school finance system, which allocate W^c type property tax base unevenly among districts, with Serrano criterion II.

Alternative DFC Specifications

Various reform school finance systems are being proposed as replacements for current finance institutions. These proposals can, in most instances, be described

as respecifications of DFC's within which citizens must choose rates of taxation (r_i, t) and amounts of public school expenditure (E_i). In this section several proposed reforms are evaluated for conformity to the Serrano criteria (I and II) stated above.

(I) Full State Funding: most writers in the area of school finance acknowledge full state funding of public schools as a valid method of solution, even though individual writers differ somewhat in their interpretations of Serrano. Full state funding would almost certainly be in conformity with criteria I and II above. For example, if:

(1.2) $E_i = R^*$

(2.2) $R_{si} = R^*$

then $\sum_{i=1}^{d} R_{si} \cdot (a.d.a.)_i = R^* \cdot \sum_{i=1}^{d} (a.d.a.)_i = t \cdot \sum_{k=1}^{f} y_k$ by the previous assumption that state taxes are proportional to family income. This system conforms to criterion I since by (1.2) $\Delta E_{i/\Delta W_i} = o$ and $\Delta E_i \, \Delta r_i = o$. The k^{th} citizen would face a FMC_{ik} equal to $\Delta t \, y_k$, required by any change in R^*, and this family price would not depend upon district residence; therefore, $FMC_{ik} = FMC_{jk}$ and criterion II is also met. Full state funding would not conform to Serrano criteria if the amount of state aid per pupil (R_{si}) were determined by a formula containing W_i.[13/] Neither would full state funding conform if the amount of family tax varied by residence --- e.g. tax credits for rural school district residents or disallowed income deductions within wealthy school districts, etc.

13/ $\Delta E_{i/\Delta W_i} < o$ does not conform by a strict interpretation of the Serrano logic; that is, poor families residing in wealthy districts would then be subject to wealth discrimination and could reactivate the Serrano class suit.

The most frequently posed reason for looking beyond full state funding alternatives is the loss of local district control over choice of E_i that state funding implies. If state government allowed local districts to "supplement" state aid with local tax revenues, then DFC_i or E_i would be a function of W_i or some other form of local wealth that would be equally objectionable to courts.[14/] Under full state funding, state government must assume a policing function to prevent unauthorized supplements.

(2) Expansion of State Supplemental Aid: Dominant thinking among education administrators lends support to proposals that would greatly expand state aid but up to levels far short of full state funding and control over local tax and expenditure decisions. Justification of this approach is based on a false interpretation of Serrano which says that the current method of school finance is unconstitutional because districts have unequal wealth per pupil. If such differences were "off-set" with supplemental state aid, each district would have equal access to revenue, local property taxation could be retained as a source of local expenditure finance, and local district control over expenditure per pupil could be maintained.

It is clear from earlier discussion of the post-Serrano period of revised school finances that such procedures have not and will not be found acceptable by courts. Suppose for example that:

$$E_i = r_i W_i + c_i (W^{**} - \bar{r} W_i) \qquad (1.3)$$

$$R_{si} = c_i (W^{**} - \bar{r} W_i) \qquad (2.3)$$

14/ Public school "extra" courses financed on a user charges basis, is an example.

for W^{**} equal to the current assessed value per pupil of some "target district" in the state. And c_i is the proportion of equalization between W^{**} and the district revenue that would be produced by a maximum permissible rate, $\bar{r}$. All districts with low wealth per a.d.a. would receive positive grant aid up to some j^{th} district for which $c_j W^{**} = c_j \bar{r} W_j$. Strict "equalization" of wealth would require that districts with assessed value per a.d.a. greater than W_j be required to transfer funds to the state in the amount of $R_{si} < o$. Since this would in effect make $\bar{r}$ an additional state tax levied only on higher wealth districts, proponents of expanded supplemental aid have argued either that W^{**} be set so high that $(W^{**} - \bar{r}W_h) \geq o$ for W_h the highest wealth district, or that $c_i = o$ for districts with $(W^{**} - \bar{r}W_i) < o$. Then all districts would realize $R_{si} \geq o$.

Alternative specifications of expanded state supplemental aid vary primarily in the total state tax bill that would be required to "equalize" resources. All versions of this approach fail, however, to satisfy Serrano criteria I and II. Notice that for (1.3), $\Delta E_i/\Delta W_i = r_i - c_i\bar{r}$ which is equal to zero for only those districts realizing a ratio of r_i to $\bar{r}$ equal to c_i, the proportion of equalization. Further, $\Delta\left(\Delta E_i/\Delta r_i\right)/\Delta W_i = 1 > o$; thus the aid program does nothing to change the feature of current school finance methods which cause each dollar of increased W_i to proportionately increase the amount of E_i that can be supported by any given local tax rate. This is the effect of greater marginal district wealth on "district price" no matter what the district realizes in supplemental aid, $R_{si} \gtrless o$.

It can be seen that FMC_{ik} is unchanged from equation (3), page 12, which represents family marginal costs in the current finance system. Thus, $FMC_{ik} \neq FMC_{jk}$ since $\Delta E_i/\Delta r_i$ is strictly proportional to W_i. Fundamental forms of wealth

discrimination existent in "family prices" within the present system remain in expanded supplemental aid systems.

(3) System Neutrality[15/] (Feldstein proposal): A recent novel approach to Serrano has been proposed on the erroneous premise that courts objected to "outcomes" --- the results of state-controlled constraints and individual behavior as revealed in district expenditure levels. The system neutrality approach asserts that Serrano requires government to engage in greater wealth discrimination, to manipulate "district prices" according to a formula based on W_i and statistical artifacts of "system behavior" until a statistical neutrality is achieved between state-wide observations on E_i, W_i combinations. The neutrality criterion states that discriminatory "prices" should be tailored for each district such that a statistically estimated, system coefficient α_1 is made equal to zero. This coefficient is to be estimated by the least squares method for the specific equational form: $\ln E_i = \alpha_0 + \alpha_1 \ln W_i + \mu_i$. No justification for selecting this specific equational form among possible alternatives is provided by Feldstein. Further, no method, either statistical or legal, is provided to resolve disputes that will surely arise over the meaning of "neutrality" when α_1, estimated for alternative equational forms, has multiple non-zero values.

The Feldstein procedure for estimating α_1 is as follows:

(i) assume, $\alpha_1 = \beta_1 + \beta_2 \gamma_{pw} + \Sigma \beta_j \gamma_{xjw}$

(for β's constants and γ's constant elasticities for variables in subscripts.)[16/]

15/ Feldstein, 1975 p. 75-89.

16/ p is for district net price and X_j are (presumably ad hoc) variables which statistically "explain" non-price influence of W_i observations on α_1.

Then, $\ln E_i = \beta_o + (\beta_1 + \beta_2 \gamma_{pw} + \Sigma \beta_j \gamma_{xjw}) \ln W_i + \varepsilon_i$

(ii) define a district's (marginal) net price (P_i) as:

$P_i = 1 - m_i$ where m_i has the same meaning as above.

Then, $\ln P_i = \ln (1-m_i) = k + \gamma_{pw} \ln W_i$

(iii) estimate β_2 as $\hat{\beta}_2$ from:

$$\ln E_i = \beta_o + \beta_1 \ln W_i + \beta_2 \ln P_i + \Sigma \beta_j X_j + e_i$$

(iv) Then, $\alpha_1 - \hat{\beta}_2 \gamma_{pw} = b_1$, estimate b_1 as $\hat{b}_1$ from

$$\ln E_i - \hat{\beta}_2 \ln P_i = b_o + b_1 \ln W_i + \theta_i$$

(v) Then,

$$\alpha_1 = \hat{b}_1 + \hat{\beta}_2 \gamma_{pw}$$

and $\alpha_1 = o$ for $\gamma_{pw} = - \hat{b}_1 / \hat{\beta}_2$

thus, marginal district net prices can be determined by the formula:

$$\ln (1-m_i) = k - \hat{b}_1 / \hat{\beta}_2 \ln W_i$$

$$\text{or, } m_i = 1 - K W_i^{-\left(\hat{b}_1 / \hat{\beta}_2\right)}$$

The system neutrality approach can be characterized in DFC terms as:

(1.4) $E_i = r_i W_i + R_{si}$

$= r_i W_i + m_i E_i$

$= \frac{r_i}{1-m_i} \cdot W_i$

$$= r_i \left[KW_i^{\left(\hat{b}_1 \hat{\beta}_2\right)} \right] W_i$$

$$= r_i \, KW_i^{\left[1+ \hat{b}_1 \hat{\beta}_2\right]}$$

(2.4) $$R_{si} = m_i E_i$$

$$= E_i \left[1 - KW_i^{-(\hat{b}_1/\hat{\beta}_2)} \right]$$

Clearly, a system neutrality approach does not conform to criteria I and II since by design, the purpose is to promote greater "district" and "family price" discrimination, and explicitly on the basis of state wealth classifications. For criterion I, district price relations yield:[17/]

$$\Delta E_{i/\Delta W_i} = r_{i/1-m_i} = r_i K \left[1 + \left(\hat{b}_1/\hat{\beta}_2\right) \right] W_i^{\left(\hat{b}_1/\hat{\beta}_2\right)}$$

The impact of a change in district W_i on the amount of E_i supportable at given levels of r_i depends upon the district's assigned matching rate and, under system neutrality rules, m_i is uniquely determined by the district's W_i and "system" parameters. In general, $\Delta E_{i/\Delta W_i}$ is smaller, the the larger is W_i since $\hat{\beta}_2$ will be negative --- increases in district net price (P_i) will be associated with lower E_i, all else the same (step (iii) of the Feldstein procedure).

The DFC defined above for system neutrality also yields the relation:

$$\Delta\left(\Delta E_i / \Delta r_i\right) \Big/ \Delta W_i = (1-m_i)^{-1} - KW_i^{\left(\hat{b}_1/\hat{\beta}_2\right)}$$

17/ $\Delta E_{i/\Delta W_i} > 0$ for $\left|\hat{b}_1/\hat{\beta}_2\right| < 1$, $\hat{b}_1 > 0$ is assumed throughout.

The impact of a change in W_i on the amount of E_i change produced by a unit change in the district's property tax rate is proportional to a district's local assessed valuation per a.d.a. For $\hat{\beta}_2<o$ and $\hat{b}_1>o$, as will surely prevail, the system neutrality plan is clearly a "reverse" form of wealth discrimination in price relations. In Serrano however the court established the strong criterion that such price relations be exactly zero.

Family price relations under system neutrality are unchanged from those described in equation (3). The $\Delta E_i/\Delta r_i$ relation faced by families of any i^{th} district is proportional to W_i and inversely proportional to m_i, which is also a function of W_i:[18/]

$$\Delta E_i/\Delta r_i = KW_i\left[1+\left(\hat{b}_1\,\hat{\beta}_2\right)\right]$$

That is, $\Delta E_i/\Delta r_i$ is inversely related to W_i if $\hat{\beta}_2<o$ and $\left|\hat{b}_1/\hat{\beta}_2\right|>1$. Only in the special situation where $\hat{b}_1/\hat{\beta}_2 = -1$ will $\Delta E_i/\Delta r_i = K$ and imply $FMC_{ik} = FMC_{jk}$.[19/]

The Serrano decision explicitly denies that equal expenditures per pupil is a required consequence or outcome of state finance systems. The decision further considered the argument that E_i was a matter of choice or preference of individuals in a school district and could not be made independent of W_i without losing local choice. While not denying factors of choice, the court reemphasized that the state

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18/ The amount by which E_i can increase for a unit increase in r_i depends upon the level of W_i but since R_{si} is a function of E_i, the net effect of Δr_i on local expenditures depends upon whether $\Delta m_i/\Delta W_i$ is positive, negative, or zero.

19/ Feldstein repeatedly criticizes the Coons power equalizing approach because district power equalizing "requires" $\gamma_{pw} = 1$, a condition which would yield conformity with criterion II.

finance system was unconstitutional because the state constrained choices (parent and district) with illegal criteria, not because choice is influenced by wealth. The Serrano decision explicitly rejected any identity between its own criteria and those rejected in McInis which would have imposed outcome standards on public school expenditures. As in McInis, the Serrano decision acknowledges the legality of systems that "... allow individual localities to determine their own tax burden according to the importance which they place upon public schools." But Serrano emphasizes that in the instant suit, plaintiffs contentions are "significantly different"[20/] --- Serrano is a complaint against budget constraint standards, e.g. "discrimination on the basis of wealth is an inherently suspect classification which may be justified only on the basis of a compelling state interest."[21/] The system neutrality criterion would plunge courts into judgments of standards that are, in the words of the McInis decision, "nebulous" and "so nebulous as to be unjusticiable" because acceptable outcome standards cannot be created, or managed if created. Who can tell which pattern of (E_i, W_i) outcomes best meets "educational needs?" The Serrano decision affirmed that courts probably would not try to impose outcome standards and that defendants had errored in believing U. S. Supreme Court affirmance of school systems yielding "wide variations" in expenditures per pupil would resolve the Serrano complaint.

Feldstein's system neutrality criterion fails as an acceptable reform in two ways. First, it does not conform to Serrano criteria I and II. (Indeed it intensifies price discrimination on the basis of wealth!) And second, it provides a manageable but totally arbitrary and unsupported norm for school outcomes. (His only present justification for further consideration being a misinterpretation of Serrano).

20/ West's, 1971, p. 624.

21/ Ibid. p. 624.

(4) Power Equalization (Coons, et.al. Proposal)[22/]

The class of proposed reforms called power equalizing has a common policy goal to eliminate the need of poor districts to use higher local tax rates than wealthier districts to achieve any given expenditure per pupil. That is, for any i^{th} district, not the highest wealth district (W_h), and any expenditure per pupil ($\bar{E}$), the ratio relation $\bar{E}/r_i W_i \geq \bar{E}/r_h W_h$ must hold. This effect on DFC's is accomplished by imposing a schedule of "permitted" expenditures per pupil at each possible local tax rate. This type of schedule is designated as $E_p = E_p(r_i)$. The schedules have the general property that at higher locally chosen tax rates, permitted expenditures are also greater, $\left(\Delta E_p / \Delta r_i > 0\right)$.

For power equalizing schemes DFC_i becomes:

$$(1.5) \quad E_i = E_p(r_i)$$

$$(2.5) \quad R_{si} = E_p(r_i) - \left(r_i W_i - c_i r_i (W_h - W_i)\right)$$

$$= E_p(r_i) - r_i \left((1-c_i) W_i + c_i W_h\right)$$

Equation (1.5) says that i^{th} district expenditures per pupil are strictly determined by the permitted expenditure schedule. Each chosen local tax rate allows a specific expenditure. Equation (2.5) describes the amount of revenue per pupil owed to an i^{th} district by the state government. R_{si} is a function of the locally chosen tax rate (r_i) and local wealth relative to the wealthiest district ($W_h - W_i$). The c_i term in (2.5) is a state determined parameter, $0 \leq c_i < r_i$.[23/] R_{si} is equal to the chosen level of E_i minus the amount of revenue per pupil raised locally ($r_i W_i$) plus a fraction (c_i) of the difference between the amount of revenue raised locally by

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22/ Coons, Clune, and Sugarman, 1970.

23/ For purposes of this discussion, c_i is assumed a constant and equal for all districts.

r_i and the amount of revenue that r_i would yield in the wealthiest district, $(c_i\ (r_iW_h - r_iW_i))$. If $c_i = o$, then $R_{si} = E_p(r_i) - r_iW_i$ and if $E_p(\bar{r}_i) \geq \bar{r}_iW_i$, $\bar{r}_i$ being an arbitrary rate of local taxation, $R_{si} \geq o$. With $c_i > o$, district receipts from the state are allocated by a "progressive" schedule; $c_i = o$ is a (district) proportional allocation of state school aid.

Power equalizing reforms conform to Serrano criteria I and II if each district faces the same $E_p(r_i)$ schedule in its DFC as every other district and if $c_i = o$. This can be shown in the following manner. Expenditures in each district are financed by local revenues (r_iW_i) and state transfers (R_{si}). The exact relation in DFC_i is:

$$E_i = r_iW_i + R_{si}$$

$$= r_iW_i + Ep(r_i) - r_i\left((1-c_i)\ W_i + c_iW_h\right)$$

Then, $\Delta E_i/\Delta r_i = W_i + \Delta E_p/\Delta r_i - \left((1-c_i)\ W_i + c_iW_h\right)$ and, $\Delta E_i/\Delta W_i = r_ic_i$

$$\Delta E_i/\Delta r_i = \Delta E_p/\Delta r_i \text{ and } \Delta E_i/\Delta r_i = o \text{ for } c_i = o$$

Criterion II is met if $FMC_{ik} = FMC_{jk}$: $\Delta E_i/\Delta r_i$ is identical in each district and not a function of W_i. If $\Delta E_{pi}/\Delta r_i \neq \Delta E_{pj}/\Delta r_j$ criterion II would be violated. But some power equalizing proposals suggest that $\bar{E}/r_iW_i > \bar{E}/r_hW_h$ should hold thus implying $(c_i > o)$ and this in effect makes $E_{pi} = E_p(r_i, W_i)$. Thus, "progressive" expenditure schedules cause family (and district) marginal prices to be discriminatory on the basis of state wealth classifications:

$$\Delta E_i/\Delta r_i = \Delta E_p/\Delta r_i + c_iW_i - c_iW_h$$

For $c_i > 0$ marginal family cost of E_i per unit increase in r_i depends upon W_i --- a feature of all supplemental, "progressive" aid systems.

Criterion I is also met by power equalizing reforms if permitted expenditure schedules are uniform among districts and $c_i = o$. That is,

$$\Delta E_i / \Delta W_i = \Delta E_p(r_i) / \Delta W_i + r_i c_i .$$

There is a variant of power equalizing, described below as coordinated tax base sharing (CTBS), which satisfies Serrano criteria with about the same effectiveness as full state funding alternatives.[23] Unlike full state fund and power equalizing alternatives which inherently require greater centralization of controls over school finance decisions, CTBS promotes greater local school district autonomy than is currently enjoyed. Another side effect of CTBS is the ease with which diversifications of school tax base can be accomplished without loss of local control or school tax price equality among local districts.

(5) Coordinated Tax Base Sharing (Stubblebine-Teeples Proposal)[24]

The role of state government in this proposal is primarily limited to defining the proper state-wide tax base to be used for education finance and the process of allocating that tax base among competing districts. The tax base could be income, sales, property, other taxes or any combination of these. For purposes of illustration, assume the state designates property as a proper base and that the state has determined the state-wide property tax base per state a.d.a. (W_s) is:

$$W_s = \sum_{i=1}^{d} W_i$$

23/ Coordinated tax base sharing is equally certain to conform to Serrano except for the possible abberation in family tax prices noted earlier for W_i^c type property.

24/ W. C. Stubblebine and R. K. Teeples, 1974.

Each i^{th} district is allocated share W_i, as currently defined. For school taxation, locally determined rates (r_i) are applied to W_i; revenues made available for local use are determined as if local tax rates were applied to W_s. An i^{th} district's school finance constraint and state aid formula under CTBS are defined as:

(1.6) $E_i = r_i W_s$

(2.6) $R_{si} = r_i (W_s - W_i)$

This specification of finance constraints conforms to Serrano criteria I and II. We have:

$$E_i = r_i W_i + R_{si} = r_i W_s$$

and, $\Delta E_i / \Delta W_i = o$; $\Delta E_i / \Delta r_i = W_s$; $\Delta \left(\Delta E_i / \Delta r_i \right) / \Delta W_i = o$

From the point of view of families, $FMC_{ik} = FMC_{jk}$ since, whatever the wealth of one's district of residency, the impact on E_i of a unit change in local r_i is exactly proportional to W_s. In effect every district has the state-wide average tax base per a.d.a. as a constraint on school finance decisions. Districts with below average wealth, $(W_s - W_i) > o$, receive positive state aid transfers. Districts with above average wealth realize $R_{si} < o$ and must make transfers to the state. The total receipts (of deficit districts) from the state school fund is equal to the amount of revenue raised within such districts by locally chosen rates and the amount of revenue that would have been produced with the same rates had district wealth been equal to $W_s \cdot (ada)_i$. Total payments to the state school fund are equal to the surplus of district tax collections over the amounts that would have been

produced had locally chosen rates been applied to W_s. Any net deficit (or surplus) in the state school fund would be financed (or distributed) by assessing a proportional school tax on individual incomes (or an income rebate for surpluses).

Under this plan, state government is used to manage a state tax base for public schools. But, state government is not required to determine proper expenditure levels, continually update permitted expenditure schedules, or manage complicated, intricate aid programs requiring massive state bureaucracies.

Summary

Alternative reforms of the current system of school finance in California have been examined for conformity to Serrano criteria. Full state funding and coordinated tax base sharing, and proportional power equalizing alternatives were found to conform; expanded supplemental aid schemes and system neutrality alternatives are clearly misguided reform attempts as judged by Serrano criteria.

An internal conflict in Serrano claims was revealed. Insofar as local district control is maintained over choice of property tax rates and property assessed valuation is retained as a major source of revenue (both conditions approved by Serrano), criterion II cannot be obtained with perfect accuracy due to the presence of property that creates perceived opportunities to "export" local tax burdens. There seems no way to reconcile these conditions and therefore, real world reform alternatives that retain local autonomy and property taxation must be judged on the relative degree to which they remove wealth discrimination from school price determination.

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